The Chromosomes in Diabrotica vittata, Diabrotica soror and Diabrotica 12-punctata: N. M. Stevens.

Diabrotica vittata has an unpaired heterochromosome which passes undivided to one pole of the first spermatocyte spindle and divides in the second maturation division. *Diabrotica soror* and *Diabrotica 12-punctata* have, in addition to the unpaired heterochromosome, in about fifty per cent. of the male individuals collected, one, two, three or four small "supernumerary" heterochromosomes, the number being constant for the individual. The supernumeraries divide sometimes in the first, sometimes in the second spermatocyte mitosis.

The Experimental Control of Asymmetry at Different Stages in the Development of the Lobster: Victor E. Emmel.

In the adult lobster asymmetry of the chelæ is very stable and not subject to reversal, but in the first four larval stages it was found that right or left asymmetry can be produced at the will of the experimenter; consequently it appears that the possibility for experimental control of asymmetry is correlated in some way with the degree of differentiation or development of the organism. These facts indicate that the factors controlling asymmetry become operative after the organism leaves the egg, and that "right- or left-handedness" is not necessarily a question of "inheritance" or even of "alterations in germinal organization."

The Physiological Basis of Restitution of Lost Parts: C. M. Child.

The paper includes a discussion of Holmes's hypothesis of form-regulation and a statement of the writer's position regarding the physiological basis of the process of restitution, which is that a lost part can be replaced only when some other remaining part is physiologically sufficiently similar to it to perform its chief functions qualitatively if not quantitatively, after its removal.

The Process of Heredity as exhibited by the Development of Fundulus Hybrids: H. H. Newman.

Heredity is conceived of as essentially a resemblance in developmental process between offspring and parents and is studied experimentally as such.

In hybrids between these two species of fish the earliest disturbances of the normal developmental process produced by the introduction of foreign spermatozoa are noted, the origin and rhythmic flux of characters are studied, and attempts are made to get some light on the ultimate physiology of the process. Accompanying the paper are pictorial tables showing the comparative developmental processes of the two pure breeds and the reciprocal crosses.

Variation, Heredity and Evolution in Protozoa. I. The Fate of New Structural Characters in Paramecium, with Special Reference to the Question of the Inheritance of Acquired Characters in Protozoa: H. S. Jennings.

The author followed the fate at reproduction of many new or "acquired" structural characters, some produced experimentally, some found in nature. These were not inherited. Sometimes such a character is handed on bodily to a single individual of each generation; one was thus followed for twenty-two generations. But there is no tendency for them to multiply and produce a race bearing them. Such a tendency shows itself only in the case of the very rare characteristics arising from something permanently modifying the process of fission. "The inheritance of acquired characters" takes place no more readily nor generally in protozoa than in higher organisms.

LITHIUM IN RADIOACTIVE MINERALS[1]

The question as to whether lithium is or is not a widely occurring element, and whether it is found associated with any other element, more particularly with copper than with the alkalies or the alkaline earths, arises from the assumed transmutation of copper contained in solutions, into lithium, neon and possibly other substances.

[1] Abstract of a paper by Professor W. N. Hartley at the Dublin meeting of the British Association.

It has been stated by Sir William Ramsay:[2]

"As sodium and potassium are much more widely distributed than lithium, it is more likely that they are the chief products from copper, and that some modifying circumstance has determined the formation of a trace of lithium. . . . Lithium was mentioned because it is an unlikely constituent of dust, glass, copper, etc., which were tested specially to prove its absence."

There are two statements here which, according to my experience, appear to require modification. That potassium and sodium are more abundantly distributed than lithium is true, but that these are more widely distributed is not strictly correct; nor can it be accepted as unquestionable that lithium is an unlikely constituent of dust, glass, copper, etc. Evidence to the contrary is based upon facts divided into three categories—firstly, those derived from the qualitative spectroscopic analysis of common ores and minerals usually associated with the alkali metals; secondly, analysis of the crude salts of the alkalies, such as the Stassfurth minerals and nitrates from Chili and Bengal, show that they contain lithium and rubidium, with not unfrequently cæsium. Facts belonging to the third category are derived from experimental evidence, which is both quantitative and spectrographic, the source of the spectra being the oxyhydrogen flame. When half a gram of material yields a photograph of the spectrum of lithium on which the four chief lines are visible—namely, $\lambda\lambda$ 6708, 4603.07, 4132.93 and 3232.82—there cannot be less than 0.0089 gram of lithium present. When only the lines 6708.0 and 4603.07 are visible, the quantity is not less or more than 0.0041 gram.

When only the red line is photographed the quantity is not more than 0.002 gram, and with half this quantity the line ceases to be photographed. It follows, therefore, that from the evidence afforded by the number of plates on which this line appears there could scarcely be less lithium in the 0.5 gram of material analyzed than 0.2 per cent.

Further results have been obtained with several other metallic compounds, but the sensitiveness of the flame reaction varies extraordinarily with the spectra of different elements.

Mr. Ramage and I found in 170 common ores and minerals potassium and sodium, and with these common elements rubidium and lithium were very generally associated. Thus, of sixty-two iron ores, rubidium was found in sixty-one. In sixteen red hæmatites, massive minerals of the purest type, rubidium was contained in four. Where potassium and rubidium occurred lithium was invariably found. It was found in limestones, in dust, in the Bessemer flame, in ordinary pipeclay, tobacco pipes, and a great variety of siliceous minerals, such as the Dublin granites; in Donegal kyanite, which contains 98 per cent. of aluminium silicate; and in asbestos. It was found in dust which fell from the clouds, in volcanic dust, in soot, in flue-dust from chemical works, and in that from copper smelting and refining works. This last material contained lithium, sodium, potassium, rubidium and cœsium, copper, silver, calcium, strontium, aluminium, gallium, indium, thallium, iron, nickel, cobalt, manganese, chromium, lead, zinc, cadmium and tin. Upon such evidence as this it is impossible to corroborate the statement that potassium is a more widely distributed element than lithium, or that lithium is an unlikely constituent of dust, glass, copper, etc.

[2] *Nature*, March 5, 1908, p. 412.

SPECIAL ARTICLES

ON THE ORBITOSPHENOID IN SOME FISHES

I WISH to call attention to the following paragraph recently published by Dr. L. S. Berg[1] in reference to an orbitosphenoid alleged by different authors from time to time to exist in various fishes.

Das Orbitosphenoid fehlt bei allen untersuchten Formen. Prof. Starks, der diesen Knochen bei den Fam. Berycidae und Monocentridae fand, sagt in seiner interessanten Abhandlung folgendes:[2]

[1] "Die Cataphracti des Baikal-See," p. 26. Wissensch. Baikal-See Exped., Lief III., 1907.

[2] *Proc. U. S. Nat. Mus.*, XXVII., 1904, p. 601. "It is remarkable to find this archaic character